REMARKS

Claims 1, 6, 7, 12-16, 26, 28, 29 and 31 are pending. Through this Amendment, claims 1, 6 and 7 have been amended, and claims 2-5, 8-11 and 27 have been cancelled. Support for the amendments can be found, *inter alia*, in the original claim set and on page 10, lines 13-17 of the specification, as originally filed.

Applicants' Response to 35 U.S.C. §102 Rejection over Short & Whittle

Claims 1, 8-16, 27, 28 and 31 were rejected under 35 U.S.C. §102(a) as being allegedly anticipated by WO 01/031339 to Short et al. (hereinafter "Short & Whittle") as evidenced by WO 98/19161 to Schwartz et al. (hereinafter "Schwartz").

Claim 5 has been incorporated into claim 1. Claim 5 was not rejected on this basis. It is respectfully submitted that claim 1, as amended, along with dependent claims 12-16, 28 and 31, are patentable over Short & Whittle.

Applicants' Response to 35 U.S.C. §102 Rejection over Short

Claims 1-16, 26-28 and 31 were rejected under 35 U.S.C. §102(e) as being allegedly anticipated by WO 2004/040308 A1 to Short et al. (hereinafter "Short") as evidenced by Dako General ELISA Procedure, February 2002 (hereinafter "Dako").

Applicants have amended claim 1. In particular, the biological entity has been limited to a glycosaminoglycan. Furthermore, claim 1 has been amended to indicate that the inventive method relates to selective disassociation of bound glycosaminoglycan from a plasma polymerized surface. Nowhere in the cited reference is the method for selective disassociation of claim 1 disclosed or suggested.

The Examiner alleged that Short teaches a method according to the present claims and points to an ELISA reference for support of the concentration ranges.

ELISA is used for detecting the presence of *bound* biological agents. Utilizing ELISA with a low concentration of NaCl washing solution merely removes unbound biological material, but does not remove *bound* biological material. Removing unbound biological material is entirely different from the method set forth in the instant claims wherein biological material is bound and then selectively disassociated. Accordingly, Applicants respectfully submit that utilizing washing buffers for ELISA and the method according to the present claims is easily distinguishable to one of skill in the art.

As is known in the art, immobilization or binding of a biological material typically involves passive adsorption onto a plasma polymerized surface. Once a biological material, such as a glycoaminoglycan, is bound to a plasma polymerized surface it cannot be simply desorbed by washing or any typical assay. (See Instant Specification, page 10, lines 13-20). ELISA is an extremely well known immunoassay not intended for disassociating bound biological materials. Accordingly, one of skill in the art would not expect bound biological material to be removed when utilizing standard ELISA techniques.

As set forth in the present claims, the present invention is directed to the selective removal or disassociation of bound glycosaminoglycan from a plasma polymerized surface. Nowhere in the cited references is this method disclosed or suggested. It is respectfully submitted that claims 1, 6, 7, 12-16, 26, 28 and 31, are patentable over Short.

Applicants' Response to 35 U.S.C. §103 Rejection over Short & Whittle, Schwartz, Marchant and Schwarz

Claims 1-16, 26-29 and 31 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Short & Whittle, as evidenced by Schwartz, in view of WO 94/10938 to Marchant (hereinafter "Marchant") and Schwarz et al., Glycobiology, 2003, vol 13, No. 11, p. 749-754 (hereinafter "Schwarz").

The Examiner acknowledged that Short & Whittle does not teach a salt concentration of about 100mM to 2 M NaCl, but alleged that this would be obvious based on the teachings of Marchant and Schwarz. Applicants respectfully traverse.

Marchant is directed to a plasma polymer-modified surface that may have heparin attached thereto. In the "Response to Arguments" portion of the Office Action, the Examiner stated:

> Applicant traversed Marchant based on their erroneous definition of a linear salt gradient as "an initial salt concentration of 3 M that increases to a higher ionic strength." The examiner notes that one of skill in the art would appreciate that a linear salt gradient is defined as a final salt concentration of 3 M NaCl, but not an initial salt concentration, as asserted by Applicants. This is evidenced by Fig. 5 of Yuan et al. "Immobilization of high-affinity heparin oligosaccharides to radiofrequency plasma-modified polyethylene,"...which appears to be the scientific counterpart of the Marchant reference.
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> (Office Action, at pages 17-18).

As stated in detail in the previous response, Marchant is directed to a column. The Examiner relied on Marchant and the Yuan paper to support the allegation that it would be obvious to use salt concentrations in the amounts claimed by Applicant. Marchant and Yuan, however, do not disclose the use of an agent as set forth in claim 1 for disassociating a bound biological entity.

The Yuan paper describes in detail how the high affinity heparin oligosaccharides (HA-heparin) are prepared. In particular, it describes how the crude heparin was separated, purified and washed to arrive at the HA-heparin. It is during this process that the salt concentrations are utilized. Yuan then describes how the HA-heparin end product, after it has been washed through a column with a buffer, is bound to a plasma polymerized surface. The Yuan paper does not disclose, teach or suggest selective disassociation of the HA-heparin once bound to the plasma polymerized surface.

According to the Examiner's own statement, Yuan is the scientific counterpart to Marchant. One of skill in the art would interpret that the high affinity heparin of Marchant is prepared according to Yuan. Accordingly, it is this HA-heparin that is bound to the surface, after it has been washed through a column with a linear salt gradient. Nowhere in Marchant is it disclosed or suggested that the bound HA-heparin is then removed from a plasma polymerized surface via selective disassociation. Accordingly, one of skill in the art would not interpret Marchant to read on the present claims.

Schwarz teaches a carbohydrate array to be used for profiling antibodies. The substrates of Schwarz are not plasma polymerized. Accordingly, it is unclear why one of skill in the art would combine a plasma polymerized plate with the carbohydrate array of Schwarz and expect any expectation of success. Furthermore, Schwarz teaches away from dissociation considering its statement that binding is detected after washing the glycan array with a 2M solution. (Schwarz, page 753).

It is respectfully submitted that claims 1, 6, 7, 12-16, 26, 28, 29 and 31 are patentable over Short & Whittle, Schwartz, Marchant and Schwarz, each taken alone or in combination.

Applicants' Response to 35 U.S.C. §103 Rejection over Short & Whittle, Schwartz, Hutchens and Marchant

Claims 1-16, 26-29 and 31 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Short & Whittle, as evidenced by Schwartz, in view of WO 98/59360 to Hutchens (hereinafter "Hutchens") and Marchant.

The Examiner acknowledged that Short & Whittle does not teach a carbohydrate and that the combination of Short & Whittle with Hutchens does not teach the salt concentration of about 2 M NaCl. The Examiner alleged that:

> One of ordinary skill in the art, at the time the invention was made, would have been motivated to use a salt concentration of about 500 mM NaCl to about 2 M NaCl for the selective disassociation of a biological entity...because it would be

> desirable, to reuse the plasma polymerized surface...for investigation of ionic strength of carbohydrate-protein interactions, as taught by Hutchens.
>
> One of ordinary skill in the art, at the time the invention was made, would have had a reasonable expectation of success for doing so because NaCl is routinely used in the standard ionic strength based salt eluants, as taught by Hutchens. In addition, as taught by Marchant, use of the 3 M NaCl linear salt gradient elution of increasing ionic strength provides selective separation of carbohydrates, such as heparin polysaccharides.
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> (Office Action, at pages 10-11).

As stated in detail above, the Examiner's interpretation of Marchant is misplaced. The reference does not teach utilizing a specific salt concentration to selectively disassociate bound heparin from a plasma polymerized surface. In contrast, Marchant merely describes how to prepare HA-heparin and how HA-heparin has better anticoagulant activity than crude heparin.

The Examiner also relied upon Hutchens to arrive at the allegation that the claims are obvious. Hutchens is directed to retentate chromatography. In retentate chromatography "analytes which are retained on the adsorbent are detected." (Hutchens, page 4, lines 20-21). This is in contrast with conventional chromatography in which "analytes are eluted off of the adsorbent prior to detection." (Hutchens, page 4, lines 21-22). It is unclear how retantate chromatography is relevant to plasma polymerization or selective disassociation. The Examiner points to Hutchens' disclosure of washing the adsorbent with eluants and different concentration levels of eluants. Similar to the discussion of Marchant above, one of skill in the art would appreciate that the eluants of Hutchens are simply removing unbound biological material. One of skill in the art would also appreciate that these materials were not bound to a plasma polymerized surface. Therefore, Hutchens adds nothing of relevance to Short & Whittle, Schwartz or Marchant.

It is respectfully submitted that claims 1, 6, 7, 12-16, 26, 28, 29 and 31 are patentable over Short & Whittle, Schwartz, Hutchens and Marchant, each taken alone or in combination.

Applicants' Response to Double Patenting Rejection

Claims 1-16, 26-29 and 31 were rejected on the grounds of nonstatutory obviousness-type double patenting as being allegedly unpatentable over claims 1, 3-25 and 33-38 of co-pending U.S. Application No. 10/533,063, in view of Schwarz and Hutchens.

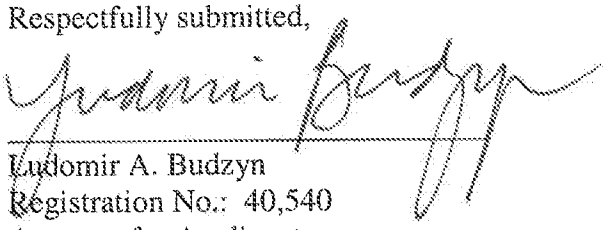
Claims 1-16, 26-29 and 31 were rejected on the grounds of nonstatutory obviousness-type double patenting as being allegedly unpatentable over claims 85, 87, 90-94, 96, 102, 103, 108, 109 and 112-123 of co-pending U.S. Application No. 10/560,210, in view of Schwarz and Hutchens.

Claims 1-16 and 26-31 were rejected on the grounds of nonstatutory obviousness-type double patenting as being allegedly unpatentable over claims 41, 47-50 and 54 of co-pending U.S. Application No. 10/509,431, in view of Marchant, Schwarz and Hutchens.

Applicants respectfully submit that the amendments herewith overcome the double patenting rejection. However, in the interest of advancing prosecution, Applicants will consider filing a terminal disclaimer, or canceling/amending claims, as necessary once any of the claims have been allowed. Applicants request the issuance of an *Ex parte Quayle* action if this case is in all other respects found allowable.

Favorable action is earnestly solicited. If there are any questions or if additional information is required, the Examiner is respectfully requested to contact Applicants' attorney at the number listed below.

Respectfully submitted,



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